

Tertiary wastewater treatment by direct filtration

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August 1986

Abstract

This study aimed to determine the treatability of ARAMCO secondary effluents by tertiary treatment using a direct filtration system including the optimum chemical dosages, filtration rate, filter run length, and the chlorine residual and contact time for disinfection. The study indicated that the direct filtration system with dual medium filtration was an effective tertiary process for ARAMCO secondary effluents. The recommended nominal filtration rate is 4 gpm/sq. ft. the optimum chemical dosages for coagulation of wastewater prior to filtration process were 5 mg/l alum and 0.2 mg/l polymer (Magnafloc 155), and filter run length to reach 5 feet head loss is about 20 hours for both chlorinated and unchlorinated secondary effluent.

Approximately 90 percent of the coliform bacteria were removed in the filtration process.

The product of chlorine residual and contact time to achieve 2.2 coliform bacteria per 100 ml of wastewater was 360 mg. min/l. However, the recommended value for design is 1000 mg. min/l which was based on virus removal in the Pomona Virus Study.